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ABSTRACT

The effectiveness of six classes taught remotely by amplified telephone was compared with that of identical on-campus classes. Personal characteristics associated with success under the competing educational delivery systems were also evaluated. Criteria included post-test scores on a specially constructed achievement test, final examination grades, final grades, and a student rating of progress on their personal goals. Attitudes and learning preferences were inferred from a specially constructed student survey. Judged on the basis of academic achievement, telephone classes and on-campus classes were equally successful. Using progress on student goals as a criterion, five pairs of telephone and on-campus classes obtained similar results, while for the other pair the telephone classes had a significant advantage. Successful students, regardless of method of criteria, were more motivated and responsible than their less successful counterparts. However, successful telephone students were more self-reliant and independent than successful on-campus students. (Author/JY)

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THE EFFECTIVENESS OF TELECOMMUNICATION AS AN EDUCATIONAL DELIVERY SYSTEM

June 1972

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Kansas State University

Manhattan, Kansas

June 30, 1972

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ABSTRACT

The investigation compared the effectiveness of six classes taught remotely by amplified telephone with that of identical on-campus classes. It also examined personal characteristics associated with success under the competing educational delivery systems.

Criteria from the instructor's frame of reference included post-test scores on specially constructed achievement tests, final examination grades, and final grades. Statistical adjustments were made for pre-test scores or for previous college GPA. Student ratings of progress on their personal goals served as a criterion from the student's frame of reference. Attitudes and learning preferences were inferred from a specially constructed student survey. Conclusions included:

1. Telenet and on-campus classes were equally successful when effectiveness was judged from the instructor's frame of reference.

2. Using progress on student goals as a criterion, five pairs of telenet and on-campus classes obtained similar results while on the other pair the telenet class had a significant advantage.

3. Successful students, regardless of method or criteria, were more motivated and responsible than their less successful counterparts. However, successful telenet students were more self-reliant and independent than successful on-campus students.

Implications were drawn for conceptualizing educational success, using telelecture, counseling students, and further research.

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CHAPTER I

THE PROBLEM

The delivery of educational services has been an important theoretical and practical problem ever since formal educational systems have been a feature of organized society. The "knowledge explosion" of the past decade, greater societal demands upon the physical facilities and professional services of higher education, population growth, technological advances requiring intensive training and retraining of individuals at all levels of the employment spectrum, and the increasing realization by educators and layman alike that learning is a life long process have intensified the problem of delivering educational services efficiently and economically.

The rising financial and human costs of education, coupled with greater demands by taxpayers for educational accountability, have caused educators to explore and experiment with a variety of kinds of delivery systems. Traditionally, educational institutions have been faced with severe limitations on their ability to deliver education because of their insistance on the physical presence of the instructor and his students in the classroom. Only those students who found it convenient or possible to be where the instructor was were able to take advantage of the opportunities offered by structured courses. The traditional educational delivery system, then, involves face to face contact in the classroom situation. While some variants of this model have been explored through studies of different size classes and different teaching methods (e.g. McKeachie, 1962), in most instances it is assumed that effective instruction requires the simultaneous physical appearance of teacher and students. Alternatives which depart from this pattern must be evaluated against results obtained by this established educational procedure.

Several proposed non-traditional alternatives have had some success, but also some serious drawbacks. The following examples will serve to illustrate this point:

a. Educational television except for certain specialized uses or under special (and relatively rare) circumstances, has proved to be prohibitively expensive (e.g., Carpenter, 1968; Lapore and Wilson, 1958), particularly in maintenance and in specialized need for technical personnel, equipment, and lighting (Deighton, 1971). It has also required special training for instructors and a lengthy adjustment period for them. Lack of interpersonal interaction has been a frequent student criticism (Hoban, 1965).

b. Correspondence courses have been extremely disappointing in terms of the drop-out rate. The lack of immediate feedback, impersonalism, and inability to be responsive to special learning handicaps are other frequently cited drawbacks. (Deighton, 1971).

c. Extension courses, while free from the major defects of correspondence courses, have been relatively expensive to conduct due to the high costs of travel and of transporting equipment. Also, opportunities to meet educational needs through extension courses are frequently rejected either because the location is too distant or inconvenient to attract a qualified instructor or the number of interested individuals is too small in any one location to make a course economically feasible. (Ebel, 1969; Deighton, 1971).

A recent innovation designed to overcome some of the difficulties experienced by educational television, correspondence courses, and extension courses is telecommunication. Through amplified conversation over ordinary telephone lines, two way communication between the instructor and members of a class can be conducted even when hundreds of miles separate the two physically.

The equipment and maintenance costs of the telecommunications system are much lower than those for instructional television. The costs relating to specialized support individuals such as technicians, artists, and media specialists, are much lower as well. There is an obvious saving of instructor time and expenses over the more traditional extension approach. Provision is made for immediate instructor-student interaction which television classes, correspondence classes, and extension classes cannot provide. Interaction is possible among students at different locations. By teaching simultaneously in many locations, the number of students required in any one location to make the offering economically feasible can be very saml1. There is also an obvious saving to the student in terms of time and travel since multiple locations can make the service convenient for nearly any individual in the target population.

Of course, these advantages are of no importance unless the medium of telecommunications can be shown to be as effective and economical as the established and accepted model of face to face instruction. Previous research on this question is encouraging, but not altogether conclusive.

Related Literature

Applications and subjective evaluations have been more prominent in the literature than have controlled experiments. Beginning with Rubin's report of the early experiences at Stephens College (Rubin, 1964), there have been a series of enthusiastic descriptions of special applications. Madden (1965) reported how the technique was used to bring instruction by master teachers to seven colleges simultaneously. Other applications include those to science seminars (Cook, 1965),

audio-visual instruction (Paulson, 1963), sales and marketing problems (Bellis, 1963), group communication training in the Peace Corps (Pagano, 1964), in-service training of social science teachers (Davis, 1966) and of English teachers (Hartung and Gellman, 1970), foreign language training (Quinn, 1966; Gorosch, 1967), advanced instruction in chemical engineering (Ristau, 1965), a course on educational issues (Tucker, Davis, and Jesser, 1968), graduate instruction in dietetics (Donaldson, 1968), post-graduate medical training (Meyer, 1968), and a variety of non-credit agricultural and home economics workshops (McKay, 1971). These reports illustrate the wide range of educational problems which have been attacked by the medium; but they cast little light on the question of its effectiveness.

A search of the literature uncovered only five published studies and two unpublished doctoral dissertations which represented serious evaluation efforts.

Nunley (1965) studied the effectiveness of telelecture in the retraining of elementary teachers in mathematics. One group of teachers was offered instruction in a conventional setting and another group was offered instruction simultaneously through telelecture.

Achievement pre- and post-tests, a mathematical ability test, a teacher attitude inventory, and a personal data form were administered to all participants. The mean change in content mastery was significantly greater for the group receiving instruction by telelecture than for the group receiving instruction in the conventional manner. This difference could not be accounted for on the basis of differences in ability, teaching attitudes, or personal background.

The author concluded that telelecture was an effective method for retraining elementary teachers in mathematics.

Boswell, Mocker, and Hamlin (1968) studied the question of whether or not remote teaching can produce results comparable with those observed on the home campus following traditional lecture methods. Three classes of Introductory Psychology were involved in the study. One group was a control (n=64) which received traditional lectures on the campus. The second group (n=63), also on the home campus, received live lectures which were simultaneously transmitted to a third group (n=22) located in a remote classroom. The same teacher taught all groups using a single set of notes.

Pre- and post-tests were administered to all groups. The pre-test showed no significant differences between groups in content knowledge. Post-tests also showed no significant difference among the groups after training.

At the completion of the course the students filled out a teacher-class evaluation form. This evaluation showed no overall differences in student attitude toward either the course content or presentation method.

A third variable was employed to detect possible classroom behavior differences among the groups. The results failed to show any differences among the groups.

Overall, these findings suggest that the remote teaching technique may be a valid learning aid and an economical vehicle for educating adults in remote areas of the state.

Edelman (1968) investigated the use of telelecture and telewriter to see if these electronic devices could be used in teaching Hebrew reading and writing to adults in two communities simultaneously. The same instructor taught the two telelecture/telewriter classes (experimental) and also taught a face to face class (control) using the same materials, tests, lesson plans, and time limits. Each of the two experimental classes enrolled 20 students while the control class consisted of 40 students.

The classes were similar in terms of range of age, sex distribution, and knowledge of Hebrew. All classes met for one hour per week for a period of 10 weeks. At the conclusion of the course tests of achievement were administered to all students in the areas of oral reading and sight reading. The results were compared with pre-tests which were administered at the beginning of the class.

A high degree of similarity was found between control and experimental groups. Comparable achievement in learning Hebrew occured. Edelman concluded, "Teaching by electronic devices (telelecture/telewriter) can be as successful as the usual method of classroom teaching. The talents of a master teacher can be effectively 'shared' in geographically scattered locations." (p. 164).

Wecke (1970) studied the effectiveness of the UNIVEX NET (University Extension Network) of the University of Illinois. This network is an educational system that provides instructional programs via telephone (telelecture) to many points within the state of Illinois.

Four basic categories were utilized in making this evaluation:

1. Final grades earned by UNIVEX NET students were compared to on-campus students.

2. Responses of remote students and on-campus students to the Course Evaluation Questionnaire (a questionnaire developed by the officer of Instructional Resources of the University of Illinois).

3. Written comments from off-campus students.

4. Written comments from instructors using the UNIVEX NET.

Results for his sample of 338 UNIVEX NET AND 448 on-campus students are summarized below:

1. A grade average of 4.02 (on a 5 point scale) was earned by telephone/electrowriter students while the comparison group (on-campus students) achieved a G.P.A. of 3.95. This difference was not statistically significant.

2. Scores on the Course Evaluation Questionnaire were reported in deciles. In all six categories, remote students rated their courses equal to or one decile higher than the norms for all university on-campus courses.

3. Seventy-five UNIVEX NET students submitted written comments. In general, they reported the telelecture method to be satisfactory, but would have preferred to have the teacher physically present. Complaints centered around the infrequent equipment breakdowns and poor handwriting of instructors. Several students indicated that there were fewer distractions with the telelecture method and therefore they concentrated better.

4. Fourteen instructors provided comments. Most negative comments centered around the space requirements of the telewriter. Most mentioned that the UNIVEX NET requires better preparation and more effort to obtain student responses. All expressed positive judgments of this system, however, and all were willing to teach future classes via UNIVEX NET.

Wecke concluded that "All data thus far collected leads to the conclusion that telephone teaching (telelecture) utilizing Victor Electrowriter equipment (telewriter) over the UNIVEX NET is effective teaching.." (p. 2).

Blackwood and Trent (1968) compared the relative effectiveness of face to face and remote teaching (telelecture) in communicating educational information to an adult audience. The sample used for the study consisted of 71 people varying in age and educational levels. All were members of the County Extension Homemakers Units in Reno County, Kansas. The sample was randomly divided into an experimental (n=37) and a control (n=34) group.

The groups were taught simultaneously by the same instructor. Pre-tests were administered to all participants. A post-test and evaluation form were completed at the end of the program.

Statistical analysis indicated no significant differences between remote vs/ face to face instruction. No effects were associated with age, level of education, time of day, or attitude measures. It was concluded that either of the two instructional teaching techniques could be used with a broad clientele and a similar amount of learning could be expected.

Puzzuoli (1970) studied the effectiveness of telelecture in extension classes at the University of West Virginia. He also sought to

determine if a difference in academic achievement existed between students who were taught by telelecture and those who experienced on-campus instruction in the same subject matter. A second objective was to determine if student opinion differed between students receiving different forms of telelecture presentations.

Samples consisted of students enrolled in two extension classes; Education 308 and Mining Engineering 224. The study covered two semesters of times and involved a variety of instructional combinations; i.e., telelecture/on-campus, telelecture only, on-campus only, telelecture (new model)/on campus. In all, 68 students were involved with each combination shown above, but the same materials, texts, and course notes were used in all classes.

Pre-test, post-test, and a student opinion questionnaire were administered routinely. A significant difference was found in the opinions of the two groups who experienced different telelecture techniques, and the particular elements most acceptable to students were identified. A significant difference was also found in academic achievement in the education course. Students instructed by telelecture obtained higher post-test achievement scores than those who received on-campus instruction. Puzzuoli concluded that the achievement of students taught by telelecture is equal to or greater than the achievement of students enrolled in an on-campus course.

Spears (1970) evaluated the telelecture as a technique for delivering professional continuing education. Members of the American Dietetic Association of Missouri were invited to attend either telelecture sessions or workshop sessions on a professional education topic. Subjects were permitted to elect the type of session they wished to attend.

The experimental (telelecture) group consisted of 64 dietitians and the control (workshop) group consisted of 77 dietitians. The subject matter, instructional materials, and instructors were the same for both techniques. Pre- and post-tests, a supplemental data sheet for collecting educational background and demographic information, and a follow-up participant evaluation sheet were administered.

Pre- and post-test analyses found no significant differences between the two groups in terms of previous knowledge or academic gain. The groups did differ on age and work experience, but an item analysis of the pre- and post- tests indicated that these differences had no effect upon achievement.

Spears concluded that the telelecture method was as effective as the workshop method in updating the professional background of her participants. Other conclusions cited the convenience and economy afforded by the telelecture system.

The literature related to the effectiveness of telelecture as an educational delivery system is sparse. In general, studies which attempted formal evaluations compared the academic achievement of those receiving

telelectures with a comparable on-campus group. Consistently, these studies reported no significant differences. These findings are sufficiently positive to encourage attempts to extend them by studying other courses and other student populations. Definitive generalizations cannot be made because of weaknesses in previous research efforts:

1. Samples have tended to be so small that there is considerable risk that errors of the second type (announcing no differences when, in fact, there were true differences) might be committed (Boswell, et. al., 1968; Edelman, 1968; Blackwood and Trent, 1968; Puzzuoli, 1970; Spears, 1970).

2. The initial comparability of the telelecture and control groups was not always established by pre-tests. (Wecke, 1970).

3. When pre-tests were administered, they were not used to reduce the unexplained variance in post-test results and thereby refine conclusions regarding the relative effectiveness of the competing systems. (Boswell, et. al.; 1968; Edelman, 1968; Blackwood and Trent, 1968; Spears, 1970.)

4. Evaluations were seldom comprehensive in the sense that objectives other than academic achievement were studied. None of the seven formal evaluation studies examined student gains on affective of psychomotor objectives. More importantly, none considered measuring "success" from the student's frame of reference.

In addition to these weaknesses, these studies largely ignored the question of "what method works best with which students?" The Boswell, et. al., (1968) and Wecke (1970) studies did examine reactions to the teaching approach, while Puzzuoli (1970) collected student opinions of the usefulness of specific aspects of the telelecture method. But no studies focused on the differences between students who clearly profited from a given method and those who failed to profit from the method.

The present investigation is designed expressly to address this last point. It will also seek to strengthen generalizations about the comparative effectiveness of telelecture and on-campus instruction by addressing the problems identified as point 1 through 4 above.

Special Concerns

As noted above, weaknesses in previous research efforts have cast doubt upon their conclusions. Aside from shortcomings in their designs, they have paid insufficient attention to two problems -- the criterion and the identification of individuals for whom the method is suited.

Perhaps the major difficulty in evaluation of any educational experience is the question of the objectives. While there is general acceptance of the proposition that evaluation is a matter of determining the extent to which objectives were reached, the question of

whose objectives has remained unresolved. The instructor always has purposes he is trying to accomplish; most students have their own purposes for being in the class. But instructor and student purpose need not coincide, so that a given experience may be a success from one frame of reference and a failure from another. It seems desirable to assess the value of educational experiences from both points of view.

The failure of previous research to discover any consistently superior teaching method (McKeachie, 1962) may be explained on a number of bases (c. f., Dubin and Taveggia, 1968). One particularly plausible explanation involves the well established proposition that learning is a function of the learner as well as of the stimuli to which he is subjected. It may well be that a given educational technique is especially effective with certain types of individuals while another technique is superior with other types. An exploration of this proposition as it applies to telecommunications seems worthwhile.

STATEMENT OF THE PROBLEM

On the basis of the foregoing, this investigation will be guided by the following questions:

1. Is the telecommunication delivery system as effective as standard classroom procedures in delivering educational outcomes:

   a. when these are assessed from the point of view of the instructor?

   b. when these are assessed from the point of view of the student?

2. Can student pre-dispositions be used to predict which students will profit most from:

   a. the telecommunications method?

   b. the standard classroom method?

The procedures for examining these questions are described in Chapter II.

Limitations

The study focuses on students and faculty involved in the programs offered by the Telenetwork System of Kansas State University and to students and faculty involved in identical courses on the campus of Kansas State University. Thus, it will be risky to generalize to other institutions, courses, faculty members, or students. In addition, only one semester's program is involved (fall, 1971).

Students in both telenetwork and on-campus courses were essentially self-selected. The fact that they "volunteered" for the educational

delivery system which they received may have introduced biases which would have been controlled by a theoretically desirable, but practically unrealistic, method of random assignment.

The various measures used in the study impose further limitations on its conclusions. To the degree that instructor examinations or grading processes were invalid, conclusions about the success of delivery systems from the instructor's frame of reference can be questioned. The same can be said of the measure of progress on personal goals. Conclusions about student characteristics related to the success of one or another method were limited both by possible criterion inadequacies and by the prospect that the specially constructed inventory of student characteristics asked the wrong questions.

Despite these limitations, the investigation is expected to supply information which can help resolve the complex problem created by society's diverse needs for effective education and its limited resources for responding to those needs. The particular contributions which the study might make are described in the next section.

NEED FOR THE STUDY

The information explosion has been a major factor in producing a society which requires education for all of its citizens. Advancements in knowledge occur so rapidly that even recent college graduates find themselves "behind the times". Methods for efficiently and economically delivering education to broad segments of the population and for updating the skills and understanding of practitioners are urgently needed. (Mayhew, 1968).

Telecommuncation may be one answer to these needs. By comparing the effectiveness of telelecture procedures with conventional classroom approaches, the investigation hopes to make a contribution to understanding the promise (and limitations) of the telecommunication delivery system.

By focusing on learner characteristics related to educational progress in alternative settings, the investigation seeks to contribute both to theoretical advances in the psychology of learning and to solutions to a practical guidance problem. Hopefully, results of this research may be used to advise prospective students of the learning conditions under which they would most likely profit.

CHAPTER II

METHODOLOGY

The purposes of this study were to compare the effectiveness of the telecommunication delivery system to that of the standard classroom and to determine if student learning preferences and attitudinal predispositions were related to the effectiveness of either system.

The Setting

The Division of Continuing Education at Kansas State University has established a telecommunication system, the University Telenetwork (telenet), which at the time of this study served 16 communities in Kansas. Telenet facilities were located in seven junior colleges, two area-vocational schools, three secondary school buildings, one state hospital, one state university, one private four year college, and one state university extension center. (See Appendix A). All locations were equipped with a 50A Telelecture Unit and a telephone terminal jack. Supporting audio-visual equipment was also available at each location.

All telenetwork locations were staffed by monitors who were responsible for the operation and maintenance of the telelecture equipment. Monitors also served in an instructional support role by assisting the instructor in the operation of audio-visual equipment, distribution of handout materials, proctoring of tests, and other assistance as requested by the instructor.

The telenet location at Kansas State University was a typical classroom equipped in the same manner as off campus locations. It served as both a telenet classroom and a standard classroom for on campus classes.

Six courses were selected for the study because they were offered for credit both on the telenetwork and on campus. One of these courses was limited to graduate students; a second was limited to undergraduates. The other four were offered for both undergraduate and graduate credit. The title and catalog number of each course, the instructor, registration figures, and a brief description of the course and the instructional circumstances follows:

State and Local Government (269-320). Ms. Nancy Curtis. Three hours undergraduate credit. Taught in six locations with 42 students registered, (24 on campus, 18 in Telenetwork locations). Class emphasized state and local government organization and dynamics as applied to the administration of justice. Campus class and telenetwork class taught simultaneously.

The Junior College (405-620). Dr. Floyd Price. Three hours of graduate or undergraduate credit. Taught in 11 locations, with 80 students registered, (34 on campus, 46 in telenetwork locations). Class discussed the historical and philosophical development of the junior college as well as the curricular, administrative, and community responsibilities of the modern junior college. Campus class and telenetwork class taught simultaneously.

Introduction to Descriptive Linguistics (281-652). Dr. Leo Engler. Three hours of graduate or undergraduate credit. Taught in 12 locations, with 43 students registered, (10 on campus and 33 in telenetwork locations). Class designed to study basic concepts, current theory, and practical applications of modern descriptive linguistics. Campus class and telenetwork class taught separately by the same instructor.

Consumer Issues, 1972 (630-720). Dr. R. L. D. Morse. Three hours graduate or undergraduate credit. Taught in 16 locations, with 119 students registered, (4 on campus and 115 in telenetwork locations). Class focused on current consumer issues and drew upon a number of resource people from the University, government and industry. Campus class and telenetwork class taught simultaneously.

Adult Basic and G.E.D. Education (410-754). Dr. Albert Campbell. Three hours of graduate or undergraduate credit. Taught in 13 locations, with 58 students registered, (8 on campus and 50 in telenetwork locations). This class dealt with problems of educationally and economically disadvantaged adults in our society and the ways the adult educator may reduce these problems. Campus class and telenetwork class taught simultaneously.

Occupational Experience Supervision (410-871). Dr. James Albracht. Three hours graduate credit only. Taught in 12 locations, with 36 students registered (10 on campus and 26 in telenetwork locations). Class analyzed objectives and scope of occupational experience programs and the evaluative techniques related to these programs. Campus class and telenetwork class taught simultaneously.

Educational outcomes of these six on-campus courses and their telenetwork counterparts will constitute the chief data of this investigation.

Data Collection

All participants in the study were volunteers. Instructors were contacted before the term began and the plan for the study was explained. Each instructor was requested to: (a) participate in the study by providing class time for administering necessary materials, (b) prepare pre- and post-tests for the class, and (c) prepare a short written statement of their objectives for the class. A follow-up letter was sent to each instructor shortly after the initial interview reviewing the research procedures and encouraging their participation. All

six of the instructors agreed to participate in the study. Four prepared pre- and post-tests and four submitted statements of their objectives for the course.

Students were asked to participate in the study by two means. The on campus students were contacted by the researcher in an early class meeting and the project was discussed with them. Telenet students were informed of the details of the study through the telelecture medium. Both groups were informed that participation was voluntary and would have no bearing on their course grade. None of the 378 students from the two settings declined to participate in the study.

The distribution, administration, and collection of research materials was standardized as much as possible. Materials were sent by mail to each telenet location well in advance of the actual administration date. Monitors in each location were apprised of the procedures that would be followed in administering each instrument and were trained, prior to the administration date, in the tasks they would perform as proctors. On campus these tasks were performed by the researcher.

In both telenet and on campus locations, tests and questionnaires were administered by the researcher at specified times so that procedures were standardized. Telenet classes received directions over the telelecture equipment while on campus classes received directions in person. This same procedure was also utilized in make-up sessions.

The collection of material from the telenet locations was completed by the monitors who returned them by mail to Kansas State University. On campus materials were collected directly from the participants. Each set of materials was checked off a class list so that provision could be made for follow-up and make-up.

Measures

Several types of measures were needed. The most important were measures of educational outcomes. These were assessed from two frames of reference: the instructor's and the individual student's.

Outcomes: Instructor Frame of Reference. It was anticipated that three relevant measures might be obtained from each class: the specifically constructed post-test, a more comprehensive final examination, and the final grade; the latter presumably included appraisal considerations beyond those available from the final examination.

For various reasons, it was impossible to collect all three measures from all classes. However, at least one measure was available for each. The chart below summarizes the criterion measures available from each class for assessing success from the instructor's frame of reference:

Courses	Measure		
	Post Test	Final Exam	Final Grade
State and Local Government	yes	yes	yes
The Junior College	no	yes	yes
Introduction to Descriptive Linguistics	yes	yes	yes
Consumer Issues, 1972	yes	no	yes
Adult Basic and G.E.D. Education	yes	no	yes
Occupational Experience Supervision	no	no	yes

In-put Controls. The measures described above were expected to focus almost exclusively on academic accomplishment. A sizeable literature has suggested that such outcomes are, in large part, a function of preexisiting differences among students on related intellectual characteristics. These might be differences in previous subject matter knowledge, differences in general academic ability, or both. An attempt was made to provide measures of such differences so that variation due to them might be statistically controlled.

For those courses where pre-tests were written by the instructor, the score on this test was considered as the best available in-put control. It presumably reflects differences due to both ability and experience. Such a measure was available for the four classes for which post-test measures were available. (See chart above). An example of a pre-test is provided in Appendix B.

Since nearly all enrollees had previously had some college work, their college grade point average (GPA) could serve as a second in-put control. Because different colleges were involved as well as different majors, different amounts of academic work, and different periods of time, this measure was considered inferior to the pre-test and was used only when pre-tests were not available. Obtaining transcripts for all students proved impossible, so self reports were used. Previous research indicated that such reports were, in general, valid. (e.g., Dunnette, 1952; Nichols and Holland, 1963).

Overall Progress, Instructor's Frame of Reference. For each class, the relationship of the input measure to each criterion was determined. Resulting regression equations were used to predict the criterion status of each subject. Discrepancy scores were computed for each subject on each criterion by subtracting obtained criterion

scores from predicted criterion scores. If the obtained score was above the predicted, the discrepancy was positive; if below, the discrepancy was negative. Discrepancy scores were not computed if the input measure(s) failed to predict the criterion with an $\underline{r}$ of .30 or higher.

For classes with only one criterion, subjects were assigned to High (+), Average (0), or Low (-) groups on the basis of the discrepancy score (or the absolute score if no discrepancy score was computed). While no precise standard existed, an attempt was made to divide the subjects into three approximately equal groups.

If multiple criteria were involved, +, 0, and - groups were developed by considering the subject's status on each. In the case of two criteria, a combination of ++, 0+, and +0 was considered +; --, 0-, and -0, were considered -; all other combinations were considered 0. When three criteria were involved, the + group contained those with one of the following combinations: +++, +0+, ++0, 0++. The - group consisted of those with ---, -0-, --0, or 0-- ratings. Any other combination resulted in classification in the 0 group.

Outcomes: Student Frame of Reference. While the typical instructor comes to a class with a variety of purposes he is trying to accomplish, students may have their own purposes for enrolling. Instructor and student purpose(s) need not necessarily coincide. Therefore, a given educational experience may be a success from one frame of reference and a failure from another.

A Student Evaluation form (see Appendix C) was designed to evaluate the degree to which individual student purposes for taking a class were satisfied. Each student listed his most important reasons for enrolling in the class. At least one purpose, but no more than four, was listed. A numerical value, ranging from "5" (purpose was completely satisfied) to "1" (purpose was completely unsatisfied) was assigned by the raters (enrollees) to each entry. These values were averaged to arrive at the measure of "Progress on Personal Objectives".

Student Characteristics. The educational predispositions which students bring to the learning situation are assumed to have an effect upon learning outcomes. These characteristics may be classified as "learning preferences" and "personal attitudes". One focus of the present investigation was on the degree to which such characteristics could be used to predict which students will profit most from a given educational delivery system.

The specially designed Student Inventory (see Appendix D) was developed to assess these student characteristics. Section I and II of the Inventory were designed explicitly to tap educational preferences and attitudes. Section III and IV dealt with educational background and demographic information.

The items in Section I and II of the Inventory were developed to include statements which, on a common sense basis, would be facilitative of learning under one of the two delivery systems which were the subject of this study. Some items believed to facilitate learning under both conditions were also included.

Section I consisted of 32 statements about teaching techniques and learning aids. Responses were made on a numerical scale ranging from "1" (a hindrance to my learning) to "4" (of great assistance to my learning).

Section II consisted of 27 personal attitude statements. Responses were made on a numerical scale ranging from "1" (strongly disagree) to "5" (strongly agree).

The rationale for including each item is suggested by the classification given below:

Preferences and attitudes expected to be facilitative of remote learning:

Preferences

Having late afternoon (after 4 p.m.) classes.
Having classes in the evening.
Having one long class a week rather than several shorter ones.
Receiving course information from slides, transparencies, handouts, etc.
Being a member of a small class.

Attitudes

The main reason I take classes is the encouragement (pressure) of my employer.
College level learning requires a college atmosphere (college buildings, classrooms, etc.).

Preferences and attitudes expected to be facilitative of standard classroom learning:

Preferences

Opportunity to obtain individual assistance with a troublesome part of a course.
Being a member of a large class.
Having library reference materials readily available.
Being able to see the instructor as he teaches.
Having the instructor see me.
Having classes in the morning.

Attitudes

I learn better when I compete with others rather than with myself.
The impression I make on other people is important to me.

Preferences and attitudes which expect to be facilitative of learning under any educational delivery system:

Preferences

Lectures by articulate experts.
Opportunity to ask questions in a class session.
Having well organized presentations from the instructor.
Having a study guide.
Major exams over large sections of the course.

Attitudes

More than most people, I stick to a job until it is finished.
I get a good deal of satisfaction out of completing a challenging task.

Descriptive Characteristics. Information was gathered in Section III which related to high school G.P.A., college/university G.P.A., and highest level of educational attainment. Students who were enrolled in graduate programs were asked to name the institution they were enrolled in at the time of the study. From this section, only the college/university G.P.A. was used for statistical analysis.

Demographic information relating to the age and sex of each student was collected in Section IV of the Inventory. These data were used only to describe the student population of the study.

Hypotheses

The hypotheses developed for this study and the data relevant to each hypothesis are reviewed below:

Hypothesis 1a. When beginning knowledge and/or cognitive capacity is controlled, mean end-of-course achievement scores will not differ for students taught by telelecture and those taught by traditional procedures.

Instructors in four of the six courses prepared pre-tests to determine the level of cognitive understanding exhibited by students prior to their enrollment in the course. Scores on these pre-tests were used as a co-variate in examining, statistically, the mean

differences between telelecture enrollees and on-campus enrollees on the available achievement criteria (post-test scores, final examination grades, final grades).

As was noted earlier, it was not possible to obtain pre-tests for the other two courses. However, almost all of the enrollees had taken previous college work. Self-reported grade point average in previous work was used as a co-variate when Hypothesis 1a was tested for these two courses. In one of these courses, final grades were available as a criterion, while both final examination grades and final grades were available in the other.

Hypothesis 1b. Mean student assessment of the degree to which personal goals were attained will not differ for classes taught by telelecture and classes taught on campus.

Students were given the opportunity to describe their personal aims in registering for the course in question. They also rated the degree to which these purposes were satisfied. The average of these ratings served as the criterion for testing this hypothesis.

Hypothesis 2a. Students who profit most from the telelecture system will not differ in their learning preferences and attitudinal predispositions from those who profit least.

Groups of "relatively successful" and "relatively unsuccessful" students were identified from the telelecture groups by the method described previously. Responses of these two groups to the Student Inventory were compared to determine if any items significantly differentiated the two groups.

A second set of analyses was done using the "personal satisfaction" criterion. Each item on the Student Inventory was used to test the hypothesis that more successful and less successful students expressed similar learning preferences and personal attitudes prior to enrollment.

Hypothesis 2b. Students who profit most from the traditional classroom system will not differ in their learning preferences and attitudinal predispositions from those who profit least.

The same procedures described for Hypothesis 2a were followed in testing Hypothesis 2b. Subjects were enrollees in the on-campus courses.

Statistical Tests

Analysis of covariance were used to test Hypothesis 1a. Student's "t" was used for Hypothesis 1b. Hypothesis 2a and 2b employed the chi square technique.

CHAPTER III

RESULTS

Attrition

While the particular classes and students which constituted the sample for this study were described in Chapter II, it should be noted that not all participated in the study. Minor losses were incurred due to enrollment attrition and failure to participate in all assessment procedures. Table 1 provides the detail on shrinkage from an original enrollment of 378 to a final sample of 331.

TABLE 1

ORIGINAL ENROLLMENT AND SAMPLE ATTRITION, BY CLASS

Class	Original Enrollment		Withdrew		Incomplete Data		Included in Study	
	On Campus	Tele-Net	On Campus	Tele-Net	On Campus	Tele-Net	On Campus	Tele-Net
Adult Basic & GED Education	8	50	0	2	0	5	8	43
Intro. Descrip. Ling.	10	33	0	9	1	3	9	21
State & Local Government	24	18	9	7	1	0	14	11
Occ. Exper. Superv.	10	26	0	2	1	0	9	24
Junior College	34	46	0	0	1	1	33	45
Consumer Issues	4	115	0	1	0	4	4	110
	90	288	9	21	4	13	77	254

From these data, it appears unlikely that shrinkage from the original pool of subjects would have a serious impact on the results. The overall withdrawal rate was 10 percent for on-campus students and 7.3 percent for telenet students. Incomplete returns were received from 4.9 percent of both the on campus and telenet students who completed the course.

It has been assumed throughout that the frame of reference would make a significant difference in judging success. This assumption was tested by classifying students into high (+), average (0), and low (-) groups on the basis of their achievement as judged from each frame of reference. The methodology was described in Chapter II. Three by three contingency tables were constructed for classes taught by each method. From these, chi-squares and contingency coefficients were computed. Results are shown in Tables 2 and 3.

TABLE 2

RELATIONSHIP BETWEEN PROGRESS FROM THE INSTRUCTOR'S FRAME OF REFERENCE AND PROGRESS FROM THE STUDENT'S FRAME OF REFERENCE, ON-CAMPUS CLASSES

Progress, Student's Frame of Reference	Progress, Instructor's Frame of Reference		
	High (+)	Average (0)	Low (-)
High (+)	3	6	5
Average (0)	15	8	14
Low (-)	6	2	7

$x^2=4.184$, d.f.=4, P>.05

TABLE 3

RELATIONSHIP BETWEEN PROGRESS FROM THE INSTRUCTOR'S FRAME OF REFERENCE AND PROGRESS FROM THE STUDENT'S FRAME OF REFERENCE, TELENET COURSES

Progress, Student's Frame of Reference	Progress, Instructor's Frame of Reference		
	High (+)	Average (0)	Low (-)
High (+)	17	22	8
Average (0)	33	46	39
Low (-)	11	22	22

χ^2=11.081, d.f.=4, P<.05

The chi-square values indicate that a significant relationship existed in telenet classes between success ratings made from the two frames of reference. The relationship was not significant in on-campus classes.

Although success ratings from the two frames of reference were not independent for telenet classes, they were far from completely redundant. As noted in Table 3, of the 61 students rated high from the instructor's point of view, only 17 rated progress on their personal goals as "high". Conversely, of the 69 who were rated lowest in achievement from the instructor's frame of reference, only 22 were in the lowest group using the student's frame of reference. The contingency coefficient, .22 (adjusted= .27), supports the assumption that success from the instructor's point of view is not closely related to success from the student's point of view.

Hypothesis 1a. When beginning knowledge and/or cognitive capacity is controlled, average scores on course achievement measures will not differ for students taught by telelecture and those taught by traditional procedures.

For four of the six courses studied, specially constructed pre-tests had been administered. Scores on these pre-tests were used as covariates for testing Hypothesis 1a with respect to these four courses.

Criterion: Post-test scores. Post-test results served as one criterion of success from the instructor's point of view. Table 4 displays the major summary statistics used in the analysis of covariance test of the null hypothesis.

TABLE 4

COMPARISON OF TELENETWORK AND ON CAMPUS CLASSES
ON PRE-TEST AND POST-TEST ACHIEVEMENT

		Pre-Test		Post-Test		
Class	Group	Mean	SD	Mean	SD	F
State and Local Government	Telenet (n=10)	12.5	3.63	13.7	3.34	.055
	On Campus (n=14)	11.1	3.85	13.1	3.74	
Introduction to Descriptive Linguistics	Telenet (n=19)	10.7	4.00	14.2	3.53	2.039
	On Campus (n=9)	11.7	2.45	13.2	2.54	
Consumer Issues	Telenet (n=104)	15.3	3.32	19.5	4.32	.066
	On Campus (n=4)	20.0	4.24	20.8	5.91	
Adult Basic and GED	Telenet (n=44)	14.6	2.97	24.7	3.95	.017
	On Campus (n=8)	17.9	4.76	26.0	4.81	

In no instance did the F test approach significance. The data of Table 4 support the hypothesis that, when initial knowledge is controlled, end of course achievement in telenet classes does not differ from that in on-campus courses.

Generally, the pre-test proved to be a relevant covariate. Pre-test scores correlated .65, .58, .31, and .40 with post test scores for the four classes listed in Table 4. Except for the Consumer Issues course, the pre-test accounted for a sizeable portion of post-test variance and thus increased the sensitivity of the statistical test.

Post-test means were adjusted on the basis of pre-test means and the correlations reported above. As might be inferred from the F tests, the differences were very slight. The largest of them occured on the Introduction to Descriptive Linguistics class, where the adjusted telenet average was 1.5 points higher than that for the on-campus group (14.4 versus 12.9). Three of the differences in adjusted means favored the telenet delivery sytem, while the other favored on-campus instruction.

Criterion: Final course grades. For the same courses, pre-test results also served as covariates in analyzing final course grades. Major findings are summarized in Table 5.

TABLE 5

COMPARISON OF TELENETWORK AND ON-CAMPUS CLASSES
ON PRE-TEST AND FINAL GRADES

		Pre-Test		Final Grade		
Class	Group	Mean	SD	Mean	SD	F
State and Local Government	Telenet (n=10)	12.5	3.63	3.2	.79	4.464*
	On-Campus (n=14)	11.1	3.85	2.4	.93	
Introduction to Descriptive Linguistics	Telenet (n=19)	10.7	4.00	2.9	.64	0.005
	On-Campus (n=9)	11.7	2.45	3.0	.87	
Consumer Issues	Telenet (n=104)	15.3	3.32	3.0	.74	4.128*
	On-Campus (n=4)	20.0	4.24	4.0	.00	
Adult Basic and GED Education	Telenet (n=44)	14.6	2.97	3.7	.47	1.247
	On Campus (n=8)	17.9	4.76	4.0	.00	

* P<05

The test of the hypothesis was complicated for the Consumer Issues course by the fact that all four on-campus enrollees were awarded a grade of "A" resulting in an estimate of no variance within that group. Therefore, the equal variance assumption underlying the analysis of variance could not be satisfied. If that difficulty is ignored, the F test was significant (P<.05), indicating a higher grade average for on-campus students when pre-test differences have been controlled. The adjusted means were 3.7 (on-campus) and 3.0 (telenet).

For two of the remaining three courses, no significant differences were found. On the State and Local Government course, however, a significant difference was found favoring the telenet group. The adjusted mean for this group was 3.1, compared to 2.5 for the on-campus group.

As a covariate, pre-test scores were generally less effective than in the post-test analyses. Correlations with final grades were .61, .18, .31, and .35 in the four classes shown in Table 5. In the two classes for which non-significant results were obtained, the adjusted means for telenet and on-campus classes were nearly identical (3.7 versus 3.9 for Adult Basic Education and 3.0 versus 3.0 for Introduction to Descriptive Linguistics).

In general, the data of Table 5 support the null hypothesis. The significant finding on the State and Local Government course favoring telenet was balanced, though somewhat shakily, by the superior record of oncampus students in the Consumer Issues class.

Final grades were also available for the two courses not included in Table 5. In these instances, self-reported grade point average in previous college work was used as a covariate. This information was collected in the Student Inventory on an eight point scale ranging from 1 (less than C-) to 4 (B-) to 8 (A). Results for these two classes are shown in Table 6.

TABLE 6

COMPARISON OF TELENETWORK AND ON-CAMPUS CLASSES ON PREVIOUS COLLEGE G.P.A. AND FINAL GRADE

		Previous G.P.A.*		Final Grade**		
Class	Group	Mean	SD	Mean	SD	F
Junior College	Telenet (n=43)	5.2	1.52	3.6	.50	2.300
	On-Campus (n=32)	5.0	1.25	3.4	.50	
Occup. Exper. Supervision	Telenet (n=23)	4.6	1.24	3.3	.56	1.292
	On-Campus (n=9)	3.4	1.13	3.6	.53	

*Scale ranges from "1" (Below C-) to "8" (A)
**Scale ranges form "0" (F) to "4" (A)

As a covariate, previous college G.P.A. was less effective than the pre-test; correlations with course grades were only .13 and .05. The F test indicated no significant differences. The adjusted means were 3.6 and 3.4 for on-campus and telenet students, respectively, in the Junior College class; in Occupational Experience Supervision

the corresponding figures were 3.2 and 3.5. The data support the null hypothesis. Where a difference does occur, though non-significant, it favored telenet in one instance and on-campus instruction in the other.

Criterion: Final examination grades. Final examination grades were available for three of the classes. In two of these, State and Local Government (SLG) and Introduction to Descriptive Linguistics (IDL), the pre-test was used as the covariate with the final examination grades. Major findings for these two classes are summarized in Table 7.

TABLE 7

COMPARISON OF TELENETWORK AND ON-CAMPUS CLASSES ON PRE-TEST SCORES AND FINAL EXAMINATION GRADES

		Pre-Test		Final Exam		
Class	Group	Mean	SD	Mean	SD	F
State and Local Government	Telenet (n=10)	12.5	3.63	2.9	.88	2.927
	On-Campus (n=14)	11.1	3.85	2.2	.80	
Introduction to Descriptive Linguistics	Telenet (n=19)	10.7	4.00	2.3	.89	.007
	On-Campus (n=9)	11.7	2.45	2.3	1.66	

The pre-test/final examination grade correlations were .59 and .19 for SLG and IDL respectively. The F test indicated that the slight differences in adjusted means (2.8 versus 2.3 in SLG and 2.3 versus 2.3 in IDL) were no greater than could reasonably be expected on the basis of chance.

In the third class for which final examination grades were available (The Junior College) previous college grade point average (G.P.A.) was used as a covariate since a pre-test was not administered. Major findings are summarized in Table 8.

TABLE 8

COMPARISON OF TELENETWORK AND ON-CAMPUS CLASSES IN THE JUNIOR COLLEGE ON PREVIOUS COLLEGE G.P.A. AND FINAL EXAMINATION GRADES

	Previous G.P.A.		Final Exam Grades		
Group	Mean	SD	Mean	SD	F
Telenetwork (n=43)	5.2	1.52	3.4	.46	.345
On Campus (n=32)	5.0	1.25	3.3	.55	

Again previous college G.P.A. was not an effective covariate, correlating only .05 with final examination grades. The F ratio was less than 1.0 and the adjusted means were almost identical (3.3 and 3.4). The null hypothesis was supported by these findings.

In summary, a total of 13 tests were made of Hypothesis 1a. Four involved the use of post-tests as criteria, six the use of final grades, and three the use of final examination grades. The pre-test was used as a covariate in ten cases and previous college G.P.A. as a covariate in the other three. The null hypothesis was retained in eleven instances and rejected in two. One rejection favored telenet and one favored on-campus instruction. The overall conclusion of the tests of Hypothesis 1a is that telenet instruction and face to face (on-campus) instruction were equally effective when criteria are measured from the instructor's frame of reference.

Hypothesis 1b. Average scores on a measure of progress in reaching personal goals will not differ for classes taught by telelecture and classes taught on campus.

Students receiving instruction via telelecture and on-campus completed the Student Evaluation form (see Appendix C) described in Chapter II. On this form students listed their personal objectives in taking a specific class. Then, using a scale which ranged from "5" (purpose was completely satisfied) to "1" (purpose was completely unsatisfied), they rated the progress they felt they had made on each purpose. These ratings were averaged for each student. Class means, by instructional method, were compared using the "t" test. Table 9 displays the data.

TABLE 9

COMPARISON OF TELENETWORK AND ON-CAMPUS CLASSES
IN TERMS OF PROGRESS ON PERSONAL OBJECTIVES

	Telenet			On-Campus			
Class	N	Mean	SD	N	Mean	SD	t
Consumer Issues	112	4.09	.65	4	4.03	.61	.19
Junior College	46	4.33	.57	34	4.14	.58	1.52
St. & Loc. Gov't.	11	3.94	.67	14	4.17	1.29	-.11
Occup. Exper. Super.	23	4.38	.52	10	3.49	1.37	2.74*
Intro. to Descrip. Ling.	21	3.93	.79	9	4.01	.54	-.05
Adult Basic & GED Educ.	27	3.96	.80	8	4.45	.55	-.23

*P<.05

In five of the six classes, the difference between telenet and on-campus classes were no larger than could be expected on the basis of chance. A significant difference was found in one class, Occupational Experience Supervision. In this case, the telenet average was significantly higher than that for the on-campus group.

The bulk of the evidence supports the null hypothesis. Since the telenet average was higher in the only instance when that hypothesis was rejected, it seems safe to conclude that telenet was at least as effective as on-campus instruction when success was measured from the student's frame of reference.

Hypothesis 2a. Students who profit most from the telelecture system will not differ in their learning preferences and attitudinal predispositions from those who profit least.

Instructor's frame of reference. To test this hypothesis, it was necessary to categorize students in the telenet classes by the degree to which they profited from instruction. The procedure for doing this when the instructor's frame of reference was employed was described in Chapter II. In essence, it involved computing adjusted criterion scores for each subject and using these scores to develop

three groups: those who profited most (+), those who profited least (-), and those whose adjusted achievement was inbetween these extremes (0). The number of students assigned to each group is shown below, by class. One class, Occupational Experience Supervision, was omitted from this because of inadequate differentiation among students (all grades were either A or B).

Class	+ Group	0 Group	- Group
Consumer Issues	28	42	34
Junior College	12	15	16
State and Local Government	4	3	3
Introduction to Descriptive Linguistics	2	12	5
Adult Basic and GED Education	14	18	11
	60	90	69

Responses by the members of each group to the 32 learning preference items and to the 27 personal attitude items were compared by using the chi square technique. It was decided to reject the null hypothesis if a chi square value of the size obtained could be found by chance less than 5 times in 100. The hypothesis was also tentatively rejected if the probability value of chi square was less than .10 and if the responses of the 0 group fell inbetween the responses of the + and - groups. Using these criteria, items significantly differentiating the three achievement groups are shown in Table 10 and 11.

Of the learning preference items, 3 were significant at the .05 level or beyond. If only chance was operating, 1.6 "significant" differences could be expected. Since more significant items were found than would be anticipated by chance, the null hypothesis regarding learning preferences was rejected.

Those profiting most were more likely than those profiting least to rate "Lectures by an articulate expert" and "Having well organized presentations from the instructor" as "very helpful". The low profit group was more likely than the others to rate as helpful, "Having the instructor able to see me".

TABLE 10

LEARNING PREFERENCE ITEMS DIFFERENTIATING AMONG RELATIVELY SUCCESSFUL, RELATIVELY UNSUCCESSFUL, AND AVERAGE TELENET STUDENTS (INSTRUCTOR'S FRAME OF REFERENCE)

Learning Preference	Group	Response* 1	2	3	4	χ^2 Prob.
1. Lectures by an articulate expert.	+ (n=60)	0	0	34	66	
	0 (n=90)	2	3	37	59	<.05
	- (n=69)	5	10	31	53	
15. Having well organized presentations from the instructor.	+ (n=60)	0	4	15	82	
	0 (n=90)	0	3	21	76	<.05
	- (n=69)	0	0	37	63	
28. Having the instructor able to see me.	+ (n=60)	7	76	7	9	
	0 (n=90)	7	67	14	12	<.05
	- (n=69)	5	55	31	9	

*Figures given are percentages. Response code: 1=a hindrance to my learning; 2=neither a hindrance nor an aid; 3=of some assistance to my learning; 4=of great assistance to my learning.

TABLE 11

PERSONAL ATTITUDE ITEMS DIFFERENTIATING AMONG RELATIVELY SUCCESSFUL, RELATIVELY UNSUCCESSFUL, AND AVERAGE TELENET STUDENTS (INSTRUTOR'S FRAME OF REFERENCE)

Personal Attitude	Group	Response* 1	2	3	4	5	χ^2 Prob.
35. I prefer to study by myself rather than with others.	+ (n=60)	7	11	20	32	30	<.05
	0 (n=90)	2	19	17	48	15	
	- (n=69)	3	14	31	33	19	
36. My motivation in this course is so strong that I feel little need of guidance and assistance from the instructor.	+ (n=60)	13	30	50	7	0	<.02
	0 (n=90)	10	49	33	6	2	
	- (n=69)	28	38	29	3	2	
42. To me, my personal evaluation of my progress is more important than the instructors's evaluation.	+ (n=60)	4	2	24	43	28	<.01
	0 (n=90)	2	11	20	50	17	
	- (n=69)	0	10	43	28	19	

*Figures given are percentages. Response key: 1=Strongly disagree; 2=Disagree; 3=Inbetween or undecided; 4=Agree; and 5=Strongly agree.

Three personal attitudes also differentiated the groups, while only 1.3 were expected on the basis of chance. All three statements implied a stronger development of personal independence on the part of the + group. Compared to the - group, the + group was more likely to prefer to study alone, to deny the need for instructor guidance and assistance, and to value personal evaluation more than instructor's evaluation.

Perhaps the main generalization suggested by these results is that students who profited most from instruction via telelecture exhibited more personal independence than those who profited least. The conclusion was supported by the three attitude statements described above and the learning preference statement denying the importance of having

the instructor able to see the student. The other two preference items suggests a greater appreciation on the part of "successful" telenet students for the opportunity to learn from an authority. Perhaps the confidence they have in themselves "permits" them to be more receptive to well planned presentations from experts.

Student's frame of reference. Hypothesis 2a was also tested when success was judged from the student's frame of reference. To do so, a distribution of scores describing success from this frame of reference was compiled. By inspection, the high profit (+) group was defined as any student whose rating of progress on personal objectives averaged above 4.5. The low profit (-) group all averaged below 3.9 on this index, while the inbetween group (0) had indices between 3.9 and 4.5. The number of subjects classified as +, 0, or - is shown below by class:

Class	+ Group	0 Group	- Group
Consumer Issues	22	55	27
Junior College	13	25	5
State and Local Government	2	4	4
Occupational Experience Supervision	8	13	2
Introduction to Descriptive Linguistics	2	12	5
Adult Basic and GED Education	7	21	15
	54	130	58

The same procedure was followed as in the preceding analysis. Tables 12 and 13 display the learning preference and personal attitude items for which the null hypothesis was rejected.

Again, three learning preference items differentiated the groups. The low profit (-) group were much more likely than the other groups to value "Listening to someone explain material I have been studying". They also placed a premium on having a study guide and on having the opportunity to ask questions in a class session.

Table 13 shows the three personal attitude items which were answered differently by the three groups. The high profit (+) group were most able to disagree with others without offending them. They also were more conscientious about completing assignments on time. Finally, they were most likely to value their own judgment of their progress over that of their instructor.

TABLE 12

LEARNING PREFERENCE ITEMS DIFFERENTIATING AMONG RELATIVELY SUCCESSFUL, RELATIVELY UNSUCCESSFUL, AND AVERAGE TELENET STUDENTS (STUDENT'S FRAME OF REFERENCE)

Learning Preference	Group	Response* 1	2	3	4	x^2 Prob.
4. Listening to someone explain material I have been studying.	+ (n=54)	0	10	58	31	
	0 (n=130)	3	16	43	38	<.01
	- (n=58)	0	1	48	51	
9. Opportunity to ask questions in a class session.	+ (n=54)	0	3	48	48	
	0 (n=130)	4	10	44	41	<.05
	- (n=58)	0	7	32	61	
22. Having a study guide.	+ (n=54)	0	12	60	28	
	0 (n=130)	3	20	45	32	<.10
	- (n=58)	0	9	52	39	

*Figures given are percentages. Response code: 1=a hindrance to my learning; 2=neither a hindrance nor an aid; 3=of some assistance to my learning; 4=of great assistance to my learning.

TABLE 13

PERSONAL ATTITUDE ITEMS DIFFERENTIATING AMONG RELATIVELY SUCCESSFUL, RELATIVELY UNSUCCESSFUL, AND AVERAGE TELENET STUDENTS (STUDENTS FRAME OF REFERENCE)

Personal Attitude	Group	Response* 1	2	3	4	5	χ^2 Prob.
37. I can disagree with another person without offending him.	+ (n=54)	0	5	17	59	19	
	0 (n=130)	1	11	20	55	12	<.10
	- (n=58)	1	3	23	70	3	
40. I almost always turn in my assignments on time or before they are due.	+ (n=54)	0	2	8	58	32	
	0 (n=130)	0	4	9	66	21	<.05
	- (n=58)	0	12	20	38	31	
42. To me, my personal evaluation of my progress is more important than the instructors.	+ (n=54)	0	3	32	37	38	
	0 (n=130)	3	9	33	43	12	<.02
	- (n=58)	0	13	17	49	20	

*Figures given are percentages. Response code: 1=Strongly disagree; 2=Disagree; 3=Inbetween or undecided; 4=Agree; 5=Strongly agree.

The general tenor of the differentiating items is not markedly different from those which distinguish +,0, and - groups defined from the instructor's frame of reference, even though only one item overlapped ("To me, my personal evaluation of my progress is more important than the instructor's evaluation"). "Self-sufficiency" and "responsibility" appear to be key concepts. Students who were less successful as judged from the student frame of reference seemed to need more guidance and assistance from others (Items 4, 9, 22, 42). They were less confident of themselves (Items 9 and 37) and behaved less responsibly (Items 40 and 42). In view of the personal nature of the criterion, it is not suprising that attitudes and preferences reflecting self-responsibility and self-sufficiency would be characteristic of successful students.

Hypothesis 2b. Students who profit most from the traditional classroom system will not differ in their learning preferences and attitudinal predispositions from those who profit least.

Instructor's frame of reference. The same procedures were followed for categorizing students in the traditional classroom system (on-campus) by the degree to which they profited from instruction. Students were placed into one of three groups based upon their adjusted criterion scores. The groups consisted of students who profited most (+), those who profited least (-), and those whose scores fell inbetween these extremes (0). Using the instructor's frame of reference, the on-campus students were assigned to each group as shown below, by class. One class, Occupational Experience Supervision, was omitted because the range of grades was too restricted to make meaningful judgments.

Class	+ Group	0 Group	- Group
Consumer Issues	3	1	0
Junior College	11	6	15
State and Local Government	5	5	4
Introduction to Descriptive Linguistics	2	3	4
Adult Basic and GED Education	3	2	3
	24	17	26

The responses by the members of each group to the learning preference and personal attitudes items of the Student Inventory were compared using the chi square technique. The null hypothesis was retained or rejected using the rules previously discussed.

A number of learning preferences differentiated the three groups. Table 14 provides the details.

Students who profited most from on-campus instruction tended to want the opportunity to seek assistance with problems that may arise; perhaps for that reason, they preferred having the instructor present physically. Students who profited least from on campus instruction expressed a preference for small classes, and for having several shorter classes per week rather than one long class. (All classes in this study met only once a week in an extended session.) One other learning preference item was significant at .05 level; this was on the item, "Being required to figure out course concepts on my own". But the + and - groups responded in a similar way. The 0 group was different

from the others, but in such a complex way that "chance fluctuation" appears to be the most likely explanation.

TABLE 14

LEARNING PREFERENCE ITEMS DIFFERENTIATING AMONG RELATIVELY SUCCESSFUL, RELATIVELY UNSUCCESSFUL, AND AVERAGE TRADITIONAL CLASSROOM STUDENTS (INSTRUCTOR'S FRAME OF REFERENCE)

Learning Preference	Group	Response* 1	2	3	4	χ^2 Prob.
3. Opportunity to obtain individual assistance with a troublesome part of a course.	+ (n=24)	0	0	13	87	
	0 (n=17)	0	7	43	50	<.10
	- (n=26)	0	17	39	44	
6. Being required to figure out course concepts on my own.	+ (n=24)	20	40	27	13	
	0 (n=17)	31	21	43	5	<.05
	- (n=26)	11	50	17	22	
21. Being a member of a large class.	+ (n=24)	13	67	20	0	
	0 (n=17)	45	43	12	0	<.05
	- (n=26)	67	22	6	6	
26. Being able to see the instructor as he teaches.	+ (n=24)	0	33	20	47	
	0 (n=17)	0	10	26	64	<.02
	- (n=26)	0	17	56	20	
29. Have one long class a week rather than several shorter ones.	+ (n=24)	7	20	27	47	
	0 (n=17)	38	31	17	14	<.05
	- (n=26)	22	39	28	11	

*Figures given are percentages. Response code: 1=a hindrance to my learning; 2=neither a hindrance nor an aid; 3=of some assistance to my learning; 4=of great assistance to my learning.

Only two of the personal attitude items differentiated the groups. These are listed in Table 15. Students who profited most were more supportive of promptness in completing assignments and reported less pressure from employers to take classes than those who profited least. The inbetween (0) group was even more supportive of promptness than the + group, but on the other item their responses were inbetween those of the + and - groups.

TABLE 15

PERSONAL ATTITUDE ITEMS DIFFERENTIATING AMONG RELATIVELY SUCCESSFUL, RELATIVELY UNSUCCESSFUL, AND AVERAGE TRADITIONAL CLASSROOM STUDENTS (INSTRUCTOR'S FRAME OF REFERENCE)

Personal Attitude	Group	Response* 1	2	3	4	5	χ^2 Prob.
39. I almost always turn in assignments on time or before they are due.	+ (n=24)	0	0	20	53	27	<.05
	0 (n=17)	0	3	7	45	43	
	- (n=26)	0	28	6	39	28	
58. The main reason I take classes is the encouragement (pressure) of my employer.	+ (n=24)	60	13	20	7	0	<.05
	0 (n=17)	55	43	2	0	0	
	- (n=26)	39	44	7	11	0	

*Figures reported are percentages. Response code: 1=Strongly disagree; 2=Disagree; 3=Inbetween or undecided; 4=Agree; 5=Strongly agree.

In general, the motivation of the + group appeared stronger than that of the - group. This can be inferred from their desire to discuss difficulties, their willingness to accept long class sessions, their commitment to their responsibility for completing assignments, and their relative freedom from employer pressures to take classes. These predispositions were similar to those of the + telenet group in their focus on motivation, but they do not have the personal independence flavor which was characteristic of the telenet group.

Student's frame of reference. The same procedure used in the preceding analysis was followed in examining groups differing in success

defined from the student frame of reference. Source and classification of subjects are summarized below.

Class	+ Group	0 Group	-Group
Consumer Issues	1	3	0
Junior College	5	21	6
State and Local Government	3	8	3
Occupational Experience Supervision	1	4	4
Introduction to Descriptive Linguistics	1	5	2
Adult Basic and GED Education	4	2	2
	15	43	17

Using the student's frame of reference, four learning preference items differentiated the three groups. See Table 16. The + group expressed a preference for periodic tests so that their progress could be regularly monitored. They were less inclined than the - group to rate "entertaining instructor" as a virtue or long class periods as a vice. While "Having a study guide" differentiated the groups, this was due to the unusually strong endorsement from the 0 group. Without further information, it seems risky to offer an explanation for this finding other than "chance fluctuations".

Differentiating personal attitude items, using this frame of reference, are shown in Table 17. On three of the items, the group profiting most appeared less self-sufficient than those profiting least. Among the + group, 75 percent were concerned about the impression they made on others compared to 54 percent of the - group. Similarly, more of the former prefered not to study alone (21 percent versus 4 percent). And only 33 percent of the + group strongly disagreed that employer pressure influenced their decision to take the course compared to 73 percent of the - group. The + group was also more conservative on Item 59, where 21 percent agreed that a traditional college atmosphere was needed as opposed to 8 percent of the -group; the 0 group, however, was even more conservative (36 percent agreed). Item 36 differentiated only at the 10 percent level, but a clear trend was established; 52 percent of the + group, 65 percent of the 0 group, and 73 percent of the - group disagreed that their motivation for the course was so strong that they felt little need for guidance.

TABLE 16

LEARNING PREFERENCE ITEMS DIFFERENTIATING AMONG RELATIVELY SUCCESSFUL, RELATIVELY UNSUCCESSFUL, AND AVERAGE TRADITIONAL CLASSROOM STUDENTS (STUDENT'S FRAME OF REFERENCE)

Learning Preferences	Group	Response* 1	2	3	4	χ^2 Prob.
10. Frequent tests over small parts of the course.	+ (n=15)	8	21	63	8	
	0 (n=43)	0	41	35	24	<.10
	- (n=17)	12	42	23	23	
16. Having an entertaining instructor.	+ (n=15)	13	42	42	4	
	0 (n=43)	0	35	29	35	<.05
	- (n=17)	0	19	54	27	
22. Having a study guide.	+ (n=15)	8	29	54	8	
	0 (n=43)	0	24	41	35	<.05
	- (n=17)	0	39	58	4	
23. Having one long class a week rather than several shorter ones.	+ (n=15)	17	38	33	13	
	0 (n=43)	35	18	24	24	<.10
	- (n=17)	42	35	4	19	

*Responses are given in percentages. Response code: 1=a hindrance to my learning; 2=neither a hindrance nor an aid; 3=of some assistance to my learning; 4=of great assitance to my learning.

TABLE 17

PERSONAL ATTITUDE ITEMS DIFFERENTIATING AMONG RELATIVELY SUCCESSFUL, RELATIVELY UNSUCCESSFUL, AND AVERAGE TRADITIONAL CLASSROOM STUDENTS (STUDENT'S FRAME OF REFERENCE)

Personal Attitude	Group	Response* 1	2	3	4	5	x^2 Prob.
35. I prefer to study by myself rather than with others.	+ (n=15)	4	17	0	42	38	
	0 (n=43)	18	29	24	12	18	<.01
	- (n=17)	0	4	23	42	31	
36. My motivation is so strong that I feel little need for guidance or assistance from the instructor.	+ (n=15)	17	25	38	13	8	
	0 (n=43)	0	65	18	18	0	<.10
	- (n=17)	19	54	19	8	0	
50. The impression I make on other people is important to me.	+ (n=15)	0	21	4	46	29	
	0 (n=43)	0	0	18	71	12	<.01
	- (n=17)	0	4	42	35	19	
58. The main reason I take classes is the encouragement (pressure) of my employer.	+ (n=15)	33	58	0	8	0	
	0 (n=43)	47	41	12	0	0	<.05
	- (n=17)	73	19	4	4	0	
59. College level learning requires a college atmosphere (college buildings, classrooms, etc.).	+ (n=15)	25	50	4	21	0	
	0 (n=43)	35	11	18	24	12	<.02
	- (n=17)	46	19	27	4	4	

*Figures given are percentages. Response code: 1=Strongly disagree; 2=Disagree; 3=Inbetween or undecided; 4=Agree; 5=Strongly agree.

The overall picture of the student who rated his personal progress high in on-campus courses contrasts markedly with that of the comparable telenet group. In the on-campus setting, students with the highest ratings appeared to be relatively dependent and unsure of themselves. Relatively speaking, their motivation was high, but their self-sufficiency was low.

In the next chapter, the findings will be reviewed and discussed. Implications will be drawn for educational delivery systems and the clientele they serve.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Problem and Procedure

A major purpose of this study was to evaluate the effectiveness of telelecture as an educational delivery system. The standard classroom was used as the model for comparison. Six classes, involving 378 students, were studied. Educational outcomes were assessed from two frames of reference: that of the instructor and that of the student. Specially constructed achievement tests, final examination grades, and final course grades served as instructor oriented criteria. Control measures included either a pre-test or previous college G.P.A. Student ratings of progress on personal objectives served as the criterion from the student's frame of reference. Analysis of these data were used to test hypotheses about the relative efficacy of the two mediums (telelecture and standard classroom).

A second purpose was to discover personal predispositions which were related to student success under the two instructional methods. Information about learning preferences and personal attitudes was collected by administering a specially-constructed questionnaire. High, average, and low achieveing students were defined on the basis of instructor's criteria. Similar groups were established using student ratings of personal progress. Responses of these groups to the learning preference and personal attitude items were compared using the chi-square technique. Separate analyses were made of telenet and on-campus courses.

Limitations

A number of circumstances placed limitations on the conclusions and generalizations which could be derived from the study.

1. The Courses. Only lecture type courses were used. Thus, generalization to courses employing different educational methods (laboratory, live demonstration, exclusively discussion, etc.) is unwarranted. In addition, classes followed an unusual format consisting of one extended period each week. Generalization to classes taught under more typical conditions (multiple weekly meetings of 50 minutes each) is precluded.

2. The Instructors. All instructors had demonstrated interest and at least minimal confidence in telelecture as an educational medium. It would be hazardous to generalize their results to instructors with different attitudes about the medium or their ability to use it effectively.

3. The Students. On-Campus students were, for the most part, regularly enrolled students at Kansas State University. But they were

all willing to enroll for a course whose format was atypical in that it met for only once a week. Such students may differ from other KSU students so much that generalization would be risky. Telenet students can be assumed to have high motivation, since most were employed full time. Whether or not results can be generalized to less well motivated students is unknown.

4. The Criteria. Potential invalidity in the instructor's tests and grading practice imposes further limits on the conclusions of this study. Furthermore, the validity of student ratings of personal progress was assumed, but not established; to the degree that this assumption is erroneous, conclusions from the study may be mistaken.

5. Other Effects. Telelecture was no doubt perceived as a novelty by many students. As such, it may have produced a "Hawthorne effect" (Roethlisberger and Dickson, 1939). Perhaps results would be different after the novelty wore off.

These limitations form the framework for the findings and conclusions which are summarized below:

Conclusions

1. Educational success defined from the instructor's point of view was relatively independent of success defined from the student's point of view.

   a. Among on-campus students, no relationship was found between success ratings made from the two frames of reference.

   b. Among telenet students, a low positive relationship (adjusted contingency coefficient of .27) existed between the two measures of success.

2. Telelecture instruction and standard classroom instruction were equally effective as educational delivery systems when criteria were measured from the instructor's frame of reference. Thirteen tests were made to determine the comparative effectiveness of the two instructional systems.

   a. In eleven instances the null hypothesis was retained.

   b. In two instances, significant differences were found between classes taught by the two methods. One favored the telelecture method and the other favored standard classroom instruction.

3. When success was measured from the student's frame of reference, telelecture instruction was at least as effective as on-campus instruction.

a. In five of the six classes, no significant differences were found on student ratings of progress on personal objectives.

b. In one class a significant difference was found, with the higher ratings being provided by students who experienced the telelecture method of instruction.

4. Students who profited most from the telelecture system differed in personal predispositions from those who profited least.

a. When success was judged from the instructor's frame of reference, six items (three learning preference and three personal attitudes) significantly differentiated among the three "progress" groups. Students who profited most exhibit more personal independence, a higher degree of motivation, and greater "openness" to the learning situation. The low profit group exhibited less self sufficiency, lower motivation, and more need for a structured learning setting.

b. When success was defined from the student's frame of reference, six other items significantly differentiated among the achievement groups. Students who gained most exhibited confidence in themselves, a higher degree of self-responsibility, and greater motivation. Students who gained least displayed a greater need for guidance and assistance from others, less responsible attitudes, and less confidence in their academic abilities.

5. Students who profited most from the traditional classroom system differed in their learning preferences and attitudinal predispositions from those who profited least.

a. When progress was judged from the instructor's frame of reference, students who profited most from on-campus instruction expressed high motivation, a sense of personal responsibility, but considerable dependency on others for assistance and support.

b. When progress on personal objectives was the criterion, six items differentiated among high, average, and low groups. Students with the highest ratings were less secure in the learning situation, more conservative in their choice of learning settings, and expressed more need for instructional support than students with lower ratings.

Students who profited most from telenet instruction contrasted markedly with students who profited most from the standard classroom method. Both groups appeared well motivated and responsible. In addition, telenet students displayed independence, self assurance, and flexibility. Successful on-campus students, on the other hand, were more dependent,

insecure, and "traditional" (conservative) with respect to educational preference.

Implications and Recommendations

Regarding the Definition of Educational Success. The relative independence of ratings by the instructor on progress toward his goals and ratings by the student on progress toward his goals suggests the need to reconsider our definitions of educational success. Traditionally, we have encouraged teachers to develop objectives (preferably behavioral objectives) and to construct appraisal devices which will measure the degree to which the objectives have been achieved. This model is especially appropriate when the instructor has been charged with the responsibiltiy of protecting the public by certifying that the student has achieved at least minimal levels of competence or knowledge. In many instances, education cannot avoid this responsibility.

But increasingly education has been serving other, more personally defined, purposes. Housewives may want to know something about the dynamics of legislation, but may be disinterested in other goals which political science instructors may have (e.g., major differences in political systems, specialized vocabularies, important historical dates and figures). Engineering students may want to know how to write technical reports, but be uninvolved, personally, with instructors' objectives that deal with footnotes, bibliographies, literary styles, or expository writing.

Educators, like other professionals, are interested in achieving the most success they can. As they seek this end, it will be important and meaningful to answer the question "From whose frame of reference should success be measured?"

The measure of progress toward personal goals used in this study was a simple self-rating. Its validity needs to be studied through intensive and sophisticated research devoted to appraising progress on such goals. In appropriate classes, personal "contracts" could be established which spell out personally defined purposes. Measurement authorities could be asked to apply all the expertise of their discipline to appraising individual progress on these goals. Although such a procedure would be prohibitively expensive if routinely followed, it would provide criteria against which the validity of self ratings could be judged.

Regarding the Application of Telelecture. Telelecture instruction appears to be a viable means for extending the services of the university to off-campus locations. Therefore, administrative policies and extension practices might be profitably reconsidered. Educational needs which can be addressed by lecture and visual aids can probably be met as effectively by telecommunications as by in-person instruction. The resulting savings in time and money could then be applied to extending new opportunities to new publics. A serious problem has been created by the increased demand for adult education and the limited resources

available to support it; telelecture appears to provide at least a partial solution which is both effective and economical.

In view of the findings regarding the comparative effectiveness of telelecture and standard classroom procedures, it seems highly desirable to extend this investigation in several ways. (1) Classes at various levels should be explored to determine if telelecture could be used effectively to teach introductory courses or those devoted to general-liberal education as well as the more advanced courses which were included in this investigation. (2) Students of varying ages and backgrounds should be included so that more can be learned about potential use and limitations of the telelecture method with groups more diverse than the adults who were included in this study. (3) Classes representing more diverse disciplines should be studied. It would be particularly helpful to know if the method could be used effectively in mathematics and the sciences.

Of course, as investigations like these are undertaken, the need for related studies will become apparent. Informal experience suggests that some instructors have more success with the telelecture method than others. It is important to discover what instructor characteristics are related to success -- organizational skills, voice quality, attitudes pertinent to educational innovation, etc. Successful work in this area will no doubt stimulate additional research into the question of whether or not training programs can modify instructor characteristics to the end that effectiveness is improved.

Regarding Selection and Guidance of Students. Although only a few of the learning preference and personal attitude items differentiated significantly among high, average, and low achievement groups, those that did offered considerable support for the view that different people learn best by different instructional methods. The findings should, of course, be cross-validated on new samples. And new items should be written to improve and expand the measurement of concepts which appear to be most relevant to success -- independence, motivation, self-sufficiency, flexibility.

The present investigation offers considerable encouragement to those who believe that learner characteristics can be matched with learning opportunities to the end that positive outcomes are enhanced. If further research supports this notion, there will be considerable practical value in assessing learner characteristics before recommending which of the available alternative opportunities would be most effective in stimulating progress on relevant objectives.

This investigation of the effectiveness of telelecture as an educational delivery system has provided considerable support for its advocates. Societal demands for educational services are heavy and will increase in the future. Telelecture appears to be one promising response to this challenge.

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APPENDIXES

APPENDIX A

TELENETWORK FACILITIES AND GEOGRAPHICAL LOCATIONS
FALL SEMESTER, 1971

Institution	Community
Barton County Community Junior College	Great Bend, Kansas
Cloud County Community Junior College	Concordia, Kansas
Dodge City Community Junior College	Dodge City, Kansas
Garden City Community Junior College	Garden City, Kansas
Hutchinson Community Junior College	Hutchinson, Kansas
Independence Community Junior College	Independence, Kansas
Kansas City Area Vocational Technical School	Kansas City, Kansas
Kansas State University	Manhattan, Kansas
Kepley High School	Ulysses, Kansas
K.U. Continuing Education-Regional Center	Wichita, Kansas
Marymount College	Salina, Kansas
Northwest Kansas Area Vocational Technical School	Goodland, Kansas
Paola High School	Paola, Kansas
Pratt Community Junior College	Pratt, Kansas
Topeka State Hospital	Topeka, Kansas
Wellington, High School	Wellington, Kansas

APPENDIX B

CONSUMER ISSUES, 1972

Name: Date:
Class Location: Social Security No.:

Issue VI and VII - "Consumer Fraud"

1. Select the best answer for the following question: What would be the results of abolishment of the "holder-in-due course doctrine" as applied to consumer transactions?

   (a) Consumer credit would be abolished
   (b) The creditor would be as responsible as the seller
   (c) There would be less credit available to consumers
   (d) Government would have to spend more on consumer protection

2. "Nailed to the Floor" is a term used in connection with:

   (a) referral selling
   (b) door to door selling
   (c) bait and switch selling
   (d) franchised selling

3. "Pyramiding" is a term used in connection with:

   (a) debt adjusting
   (b) home-improvement frauds
   (c) charity rackets
   (d) franchising

4. The legality of "Free Games of Chance" depends on whether there is involved an element of:

   (a) compensation
   (b) consideration
   (c) cooperation
   (d) coercion

Issue VIII - "Advertising"

1. Circle the legal remedy not available to the FTC in enforcing advertising laws:

   (a) cease-and-desist laws
   (b) injuntive relief
   (c) civil suit
   (d) criminal suit

2. Of each sales dollar of breakfast cereals about what part is spent on advertising?

   (a) 12¢
   (b) 7¢
   (c) 24¢
   (d) 19¢

3. Circle those which characterize advertising:

   (a) a means for changing the consumers tastes and desires
   (b) a form of consumer education
   (c) a selling tool not used by non-profit, educational institutions
   (d) a necessary defect of marketing

Issue IX - "Saving and Investments"

1. Americans save about what part of their income?

   (a) 2%
   (b) 10%
   (c) 8%
   (d) 5%

2. The rate of return derived by relating the earnings to principal amount is:

   (a) nominal rate
   (b) add on rate
   (c) effective rate
   (d) amortization rate

3. A principal amount invested at 6% compounded annually and not disturbed, will double in

   (a) 9 years
   (b) 12 years
   (c) 15 years
   (d) 16 years

4. Which will produce the most earnings?

   (a) compounded quarterly
   (b) compounded annually
   (c) compounded continuously
   (d) compounded daily

Issue X - "Credit"

1. Which of the following agencies enforce the Truth-In-Lending Act?

   (a) FAA
   (b) ICC
   (c) USDA
   (d) FCC

2. If you finance your car at a rate of 14%, will it cost you more or less if the creditor's contract is based on an assumed year of 360 rather than 365 days in length.

   ____ more costly.
   ____ less costly

3. If you had a bank credit card (Bank Americard or Master Charge) and used it in buying merchandise at a retail store, as a matter of law would you be

   ____ borrowing cash from the bank to pay the retailer
   or
   ____ obtaining credit from the retailer and authorizing him to collect from your account at the bank

4. If you terminate your 36 month installment contract (such as when you trade in your car at 30 months on the purchase of a new car), what is the basis for deciding what part of your total 30 payments went to defray the principal amount and what part went to pay the finance charges?

   (a) straight proportionate time
   (b) sum of digits
   (c) rule of 78's
   (d) amortized

Issue XI - "Insurance"

1. Credit Insurance rates are set by the Insurance Commissioner?

   ____ True ____ False

2. "20 Pay Life Insurance" is one form of which basic type of life insurance?

   (a) term life
   (b) ordinary life
   (c) limited payment life
   (d) endowment life

3. Credit life insurance is often figured at $1 for every $100 of Principal amount of the note per year. What is this rate, if considered as "decreasing term insurance"

(a) $10 per $1000
(b) $5 per $1000
(c) $20 per $1000
(d) $7 per $1000

4. Check those which are the basic elements used by the actuarian to determine life insurance premiums:

____ Mortality rate
____ Interest rate
____ Inflation
____ Loading charge

5. Number the following types of insurance policies in order of their premiums (the lowest premium would be "1" and the highest "4") for a person age 35:

____ ordinary life
____ 20 pay life
____ endowment at 55
____ renewable term

Issues XII - "Monopoly and Concentration"

1. Public utilities are considered:

(a) natural monopolies
(b) forced monopolies
(c) common monopolies
(d) classical monopolies

2. Monopolies are not in the consumers interest because they generally produce:

(a) prices so low that competitors cannot enter the field
(b) prices higher than would be the cause under competition
(c) prices at a level that does not allow for reinstatement and growth
(d) prices at a level that does not encourage new products

Issue XIII - "Equipment and Interior Furnishings"

1. Circle the correct statment

(a) Guarantee is legally stronger than a warranty
(b) Warranty is legally stronger than a guarantee
(c) There is no legal difference between warranties and guarantees
(d) There is a legal difference between warranties and guarantees

2. Which government agency is responsible for product safety enforcement?

(a) FTC
(b) FDA
(c) U.S. Department of Commerce
(d) USDA

3. Which government agency is responsible for product safety surveillance?

(a) FTC
(b) FDA
(c) U.S. Department of Commerce
(d) USDA

4. Which government agency is responsible for product safety standards?

(a) FTC
(b) FDA
(c) U.S. Department of Commerce
(d) USDA

Issue XIV - "Housing"

1. If a mortgage is written for $20,000 and the borrower is to pay "4 points" he will receive?

(a) $20,000
(b) $16,000
(c) $19,200
(d) $16,800

2. All home mortgages must comply with Truth-In-Lending?

____ True ____ False

3. If security interest is taken in ones residence as collateral for financing home repairs, the consumer has 72 hours in which to cancel the contract?

____ True ____ False

4. Who "owns" the house bought on mortgage?

____ You, the buyer ____ The financier

APPENDIX C

Name_____ Social Security No._____

Class Location_____

Course Name and Number_____

Student Evaluation

Most instructors have fairly specific goals in mind when they teach a course. The final grade is their estimate of how well a given student achieved these goals.

The instructor's rating of your success in his course may not agree with your own rating. In part, this may be because your purposes in taking the course were different than your instructor's purpose in giving it.

In the space provided below, describe as clearly as you can what your most important reasons were for taking the course. List at least one purpose, but no more than four. These can include the types of things you wanted to know about, or certain kinds of appreciations or enjoyments you wanted to gain, or skills you wanted to attain, or requirements you needed to meet, etc. The important thing is that they should be your purposes.

Then, in the column on the right, indicate the degree to which each of these purposes was achieved through the course you have just completed. Use the following key to make these ratings.

5=Purpose was completely satisfied
4=Purpose was well satisfied
3=Purpose was partially satisfied
2=Purpose was mostly unsatisfied
1=Purpose was completely unsatisfied

Purpose	Rating
1. _____	_____
_____	
2. _____	_____
_____	
3. _____	_____
_____	
4. _____	_____
_____	

APPENDIX D

Student Inventory

Course No. _ _ _ - _ _ _ Class Location_____

Your Name_____ Social Security No. _ _ _ - _ _ - _ _ _

A special study has been designed to evaluate the effectiveness of course programming. One part of the study is this Student Inventory. By answering the questions on this inventory frankly, you will help us learn how to improve course programming in the future.

Your responses are confidential and will be seen only by the research staff.

A summary of the results of this study will be made available to you at your request. (complete information at end of this form.)

I. LEARNING PREFERENCES

Different people learn best by different techniques or with different learning aids. A number of such techniques or aids are listed below. Indicate the helpfulness of each to you by using the following code:

1=A hindrance to my learning 2=Neither a hindrance or an aid
3=Of some assistance to my learning 4=Of great assistance to my learning

Helpfulness

Lectures by an articulate expert . . . . . .

Question-answer sessions in a small group. . . . . .

Opportunity to obtain individual assistance with a troublesome part of a course . . . . . .

Listening to someone explain material I have been studying . . . . . .

Having freedom to proceed at my own rate . . . . . .

Being required to figure out course concepts on my own .

Seeing demonstration of course principles by the instructors. . . . . .

Having divergent opinions expressed by peers . . . . . .

Opportunity to ask questions in a class session. . . . .

Frequent tests over small parts of the course. . . . . .

Having a definite schedule each week . . . . . ._____

Having a detailed outline of course procedures and expectations . . . . . ._____

Participating in group discussion without the instructor_____

Opportunity to apply course concepts in a "real life" setting. . . . . ._____

Having well-organized presentations from the instructor._____

Having an "entertaining" instructor. . . . . ._____

Having guest experts (resource people) for special aspects of the course. . . . . ._____

Being a member of a small class. . . . . ._____

Assigned readings in a good text . . . . . ._____

Small group discussion (exchange of opinions and experience). . . . . ._____

Being a member of a large class. . . . . ._____

Having a study guide . . . . . ._____

Major exams over large sections of the course. . . . . ._____

Discussing course material with a knowledgeable person ._____

Having library reference materials readily available . ._____

Being able to see the instructor as he teaches . . . . ._____

Receiving course information from slides, transparencies, handouts, etc. . . . . ._____

Having the instructor able to see me . . . . . ._____

Having one long class a week rather than several shorter ones . . . . . ._____

Having late afternoon (after 4:00 p.m.) classes. . . . ._____

Having classes in the evening. . . . . ._____

Having classes in the morning. . . . . ._____

II. PERSONAL ATTITUDES

Indicate your personal attitude toward each of the following statements by using this code:

1=Strongly disagree
2=Disagree

3=inbetween or undecided

4=Agree
5=Strongly Agree

Rating

More than most people, I stick to a job until it is finished . . . . . ._____

My ability to learn is more than adequate for the demands of my curriculum . . . . . ._____

I prefer to study by myself rather than with others. . ._____

My motivation in this course is so strong that I feel little need for guidance and assistance from the instructor . . . . . ._____

I can disagree with another person without offending him_____

I usually take advantage of opportunities to do additional work in a course. . . . . ._____

I get a good deal of satisfaction out of completing a challenging task . . . . . ._____

I almost always turn in assignments on time or before they are due . . . . . ._____

I learn better when I compete with others rather than with myself. . . . . ._____

To me, my personal evaluation of my progress is more important than the instructor's evaluation . . . . . ._____

I need the pressure of scheduled tests or assignments to keep me working . . . . . ._____

One of my weaknesses is my failure to finish projects I have started . . . . . ._____

Sometimes I get in trouble by making more committments than I can fulfill . . . . . ._____

Most classes seem to move too slowly for me. . . . . ._____

I am a self-starter (able to initiate work without being forced or threatened). . . . . ._____

I pride myself in being dependable . . . . . ._____

I feel I can learn as much by studying on my own as through taking formal classes. . . . . ._____

The impression I make on other people is important to me_____

I am a very cooperative individual . . . . . .

Without the instructor's evaluation, I can't tell how much progress I am making in a course. . . . . .

I generally do my most interesting work first, leaving the most distasteful for last. . . . . .

It is better to do well on a limited amount of work than to do a mediocre job in a larger amount . . . . . .

I am more motivated by what I would lose if I fail than by what I would gain if I succeed. . . . . .

Learning for the sake of learning has little appeal to me. . . . . .

I generally do better on "objective" test (multiple choice, true-false) than on "free response" (short answer, essay) exams . . . . . .

The main reason I take classes is the encouragement (pressure) from my employer. . . . . .

College level learning requires a college atmosphere (college buildings, classrooms, etc.). . . . . .

SUMMARY OF RESULTS REQUEST.

Mail summary to the address listed below:

_____
Street

_____
City State Zip Code

III. EDUCATIONAL BACKGROUND

A. High School

1. Are you a high school graduate?

___Yes, I received a regular certificate

___Yes, I have a G.E.D. equivalency certificate

___No

2. Check the alternative below which best describes the grade average you made in high school. (We know your memory may be imperfect, but give your most honest estimate).

___A
___A-
___B+
___B
___B-
___C+
___C
___C-

B. College

Have you ever attended a junior or four year college (do not count special vocational or trade schools)___Yes___No

1. Approximately how much undergraduate work have you completed?

___I have a bachelor's degree
___I completed 3 years or more of undergraduate work, but have no degree
___I completed at least 2 years, but not 3 years, of undergraduate work
___I completed at least 1 year, but not 2 years, of undergraduate work
___I completed less than 1 year of undergraduate work

2. What was the name of the college where you did most of your undergraduate work?

_____

3. What was your approximate grade average at the college where you did most of your undergraduate work?

___A
___A-
___B+
___B
___B-
___C+
___C
___below C-

4. Have you ever been a graduate student? ___Yes ___No

If you answered "yes", answer the following questions:

Graduate Degrees You Hold	From (Institution)	Major Field of Study	Year Degree was received

C. Personal Data

Your Sex: ___Female ___Male

Your Age: ___ 18 or less ___19-20 ___21-22

___ 23-29 ___30-39 ___40 or over